



Rediscovery and first record of the Phantasma Tree Snake, *Imantodes phantasma* Myers, 1982 (Serpentes, Colubridae), in Colombia

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Abstract

We report the first record in Colombia, and the first find since 1966 of *Imantodes phantasma* Myers, 1982, based on 3 specimens from Unguía municipality, department of Chocó, Colombia. The present record adds a new snake species to the country's list and extends this species' documented distribution by approximately 65 km, in a straight-line northeast from its nearest previously known Panamanian locality. This is the first report of this species for more than 50 years since its description.

Key words

Serranía del Darién; Cerro Tacarcuna; Pacific rainforest; department of Chocó; South America; distribution; range extension.

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Introduction

The widespread Neotropical genus *Imantodes* Duméril, 1853 is composed of 8 species, distributed from Mexico to northern Argentina, through Colombia, with an exclusively continental distribution (Köhler 2008, Missassi and Prudente 2015, Uetz et al. 2017). They are a group of primarily arboreal and nocturnal snakes that inhabit rainforest, mid-montane forest or dry forest (Peters and Orejas-Miranda 1970, Myers 1982, Torres-Carvajal et al. 2012), from lowlands to uplands (up to 2300 m above sea level; Rojas-Morales et al. 2014). They sometimes occur in sympatry with congeners (Myers 1982).

Six species of this genus have been reported in Colombia (Jaramillo-Martínez et al. 2013, Rojas-Morales et al. 2013, 2014, Missassi and Prudente 2015, Missassi

et al. 2015, Echavarría-R. et al. 2016, Uetz et al. 2017): *Imantodes cenchoa* Linnaeus, 1758, *I. chocoensis* Torres-Carvajal, Yáñez-Muñoz, Quirola, Smith & Almendáriz, 2012, *I. gemmistratus* (Cope, 1861), *I. guane* Missassi & Prudente, 2015 (endemic for this country), *I. inornatus* (Boulenger, 1896), and *I. lentiferus* (Cope, 1894). They are distributed in the Transandine region of the country, except *I. cenchoa* which is widely distributed (Pérez-Santos and Moreno 1988, Rojas-Morales et al. 2014), and *I. lentiferus* inhabit the Cisandine region (Peters and Orejas-Miranda 1970, Myers 1982, Pazmiño-Otamendi and Rodríguez-Guerra 2013, Frota et al. 2015).

Imantodes phantasma Myers, 1982 is known only from 2 male specimens, collected by Charles W. Myers and Tomas Quintero between 20–24 January 1966, in a

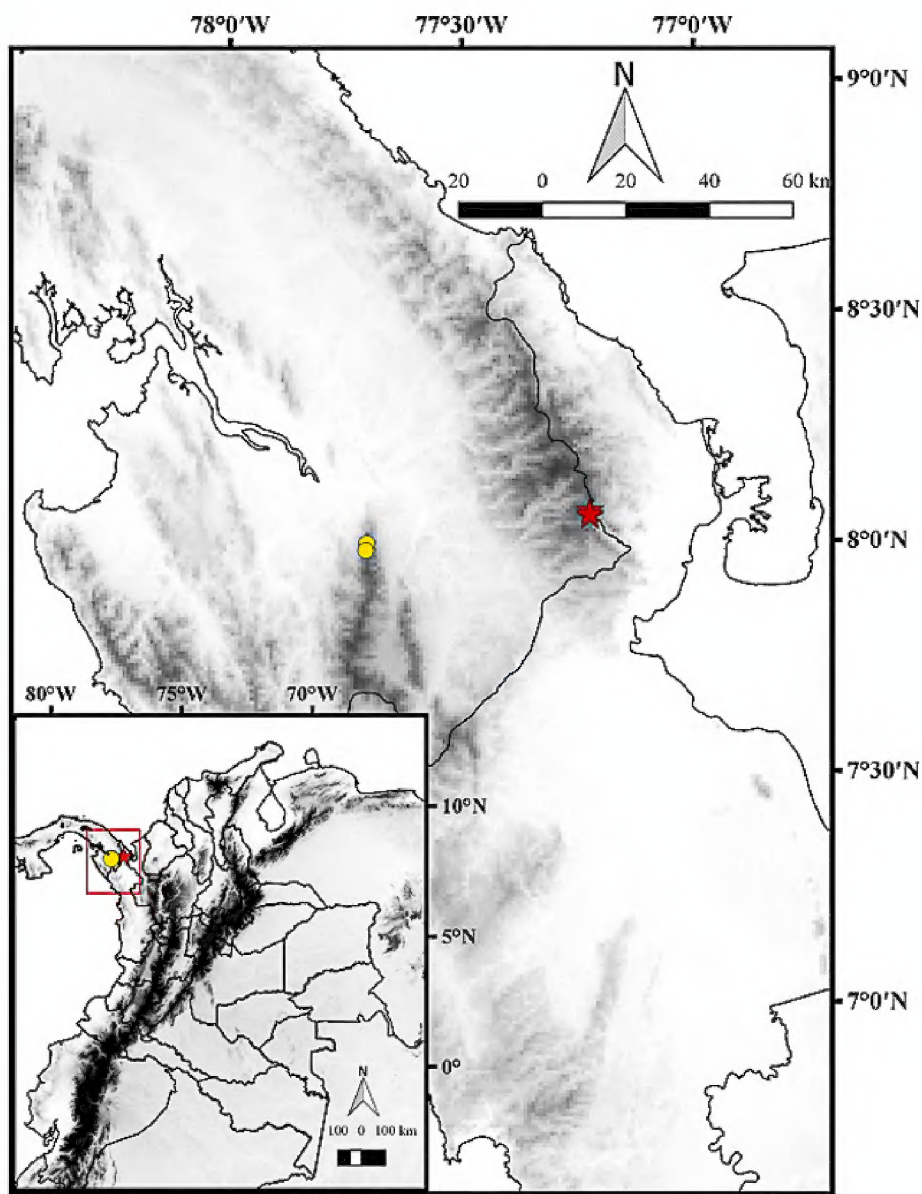


Figure 1. Distribution map of *Imantodes phantasma*. The yellow spots indicate previous records for the species in Panama (Myers 1982). The red stars indicate the localities where the specimens were found at the Cerro Tacarcuna, Unguía municipality, department of Chocó, Colombia.

montane cloud forest on the southeastern slope of Cerro Cituro, a peak on the northern end of the Serrania de Pirre, Province of Darien, Republic of Panama (Fig. 1), between 1030–1100 m (Myers 1982). Myers (1982) also said that he searched unsuccessfully for this species on the surrounding mountain formations of Serrania del Sapo, Cordillera de Juradó, and Serrania del Darién. The species has been categorized as Data Deficient by the IUCN Red List of Threatened Species (Ibáñez et al. 2013), because of the small number of specimens deposited at collections (only 2). Hence, there is scarce information about its ecology and current threats. Here, we report the first record of *Imantodes phantasma* from Colombia.

Methods

A field survey was carried out in rural area Unguía municipality, department of Chocó, Colombia by means of active searching method. The specimens were euthanized using 2% Xylocaine, fixed in 10% formalin, preserved in 70% ethanol, and tissue samples for DNA analysis were taken. Specimens were deposited at the reptile collection of the Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia, under the catalogue numbers ICN-R 12800, 12801, and 12830. Specimen identification was verified by R.A. Moreno-Arias and J.D. Lynch, and through comparison with images of the paratype AMNH-R 109493. The specimens



Figure 2. Adult female specimen ICN-R 12800 of *Imantodes phantasma* from Cerro Tacarcuna, Unguía municipality, department of Chocó, Colombia. Photo GFM.

were collected under the institutional permission of the IIAP (Decreto No. 1376 de 2013). Locality records for other specimens of *I. phantasma* were obtained from Myers (1982).

Results

New record. Colombia: Chocó: Unguía: Quebrada El Aguila, Cerro Tacarcuna, vereda Arquía-Limón, ca 14.3 km W of urban area (08°02.23'N, 077°13.46'W to 08°01.88' N, 077°13.49' W, WGS84, 1075–1175 m above sea level) (Fig. 1), 2 April 2017, Guido F. Medina-Rangel, Gladys Cárdenas-Arévalo, and Luis Eladio Rentería-M. collectors, 3 individuals (ICN-R 12800, 12801, and 12830) (Fig. 2).

We collected 3 female adults of *I. phantasma* (Fig. 2) between 19:30–23:10 h, in a field survey using active searching sampling. These specimens were found on woody vegetation up to 170 cm above ground level, near a creek, in a rainforest with a dense closed canopy exceeding 30 m in height (Fig. 3). The understory where the snakes were found consists of palms, Arecaceae (*Euterpe precatoria*, *Oenocarpus mapora*, *Socratea exorrhiza*, *Dyctiocaryum lamarckianum*), and arboreal species of the families Elaeocarpaceae (*Sloanea* sp.), Rubiaceae (*Faramea* sp., *Psychotria* sp. and *Bathysa* sp.), Melastomataceae and Lauraceae, among others. The ground was 90% covered by a thick layer of leaf litter, up to 40 cm in some locations.



Figure 3. Vegetation type of the habitat where specimens of *Imantodes phantasma* were recorded at the Cerro Tacarcuna, Unguía municipality, department of Chocó, Colombia. Photographs GCA.

Identification. Myers (1982) diagnosed *Imantodes phantasma* by dorsal color pattern, yellowish brown with black flecks and dorsal saddles on a light orangish brown body (Fig. 4); dorsal scales in 17-17-17 or 17-17-15 rows; vertebral scales about 2 times the width of mid-lateral scales and with concave or truncate rear margins; and other meristic characters that match with the collected specimens (Table 1). All characters agree with the original descriptions of Panamanian individuals, except for size, which may be due to sexual dimorphism (King 1989, Shine et al. 1999), since this species was described from 2 adult males and we collected 3 adult females.

Table 1. Scale counts, measurements, and proportions of type specimens (Myers 1982), and obtained in this study from collected specimens of *Imantodes phantasma* (ICN-R 12800, 12801, and 12830).

Character	Holotype KU 110217 ♂	Paratype AMNH-R 109493 ♂	ICN-R 12800 ♀	ICN-R 12801 ♀	ICN-R 12830 ♀
Dorsal scale rows	17–17–17	17–17–15	17–17–15	17–17–15	17–17–15
Ventrals at posterior scale-row reduction'	—	187/188	229/230	228/229	223/224
Ventrals	236	235	232	238	237
Anal plate	÷	÷	÷	÷	÷
Subcaudals (pairs)	161	156	157	152	157
Supralabials	9	9	9	9	9
Supralabials touching loreal	2–3	2–3/2	2–3	2–3	2–3
Supralabials touching eye	4–6	4–6	4–6	4–6	4–6
Preoculars	1	1	1	1	1
Postoculars	2	2	2	2	2
Temporals	1+2+3/1+2+2	2+2+2/2+2+3	1+2+2/1+1+3	1+1+2	1+2+3
Infralabials	12/11	11	11	11	11
Infralabials touching anterior genials	1–6	1–6	1–5	1–6/1–5	1–6/1–5
Infralabials touching posterior genials	6–7	6–7	5–6	5–6/6–7	5–6
Maxillary dentition (*counting on both sides)	19+2	19+2	19+2 / 20+2*	18+2 / 19+2*	19+2 / 18+2*
Eye diameter	4.0 mm	4.0 mm	3.55 mm	4.45 mm	3.55 mm
Greatest head width	9.3 mm	9.5 mm	7.75 mm	9.15 mm	8.15 mm
Head length (tip of snout to end of mandible)	15.0 mm	15.6 mm	11.85 mm	15	12.75 mm
Eye/head length	0.267	0.256	0.299	0.296	0.278
Head width/head length	0.620	0.609	0.654	0.61	0.639
Total length	1053 mm	1082 mm	761 mm	1111 mm	912 mm
Tail length	344 mm	356 mm	216 mm	351 mm	285 mm
Tail/total length	0.327	0.329	0.284	0.316	0.312



Figure 4. Comparison of the dorsal color pattern between the AMNH-R 109493 (paratype; left) and ICN-R 12801 (in life; right). Photographs: paratype David A. Kizirian and Lauren Vonnahme, and specimen in life GCA.

Table 2. Selected morphological characters for the genus *Imantodes*. Numbers in parenthesis represent the number of examined specimens. Information was obtained for *I. guanae* from Missassi and Prudente (2015); *I. chocoensis* from Torres-Carvajal et al. (2012); *I. cenchoa*, *I. inornatus*, and *I. lentiferus* from Myers (1982); *I. gemmistratus* from Zweifel (1959) and Myers (1982); *I. tenuissimus* from Cope (1866) and Smith (1942); *I. phantasma* from Myers (1982) and this study.

	<i>Imantodes</i>							
	<i>phantasma</i>	<i>guanae</i>	<i>chocoensis</i>	<i>cenchoa</i>	<i>gemmistratus</i>	<i>lentiferus</i>	<i>inornatus</i>	<i>tenuissimus</i>
Loreal	Present	Present	Absent	Present	Present	Present	Present	Present
Infralabials	11–12 (5)	12–13 (2)	12–15 (11)	8–11 (263)	9–10 (8)	10–12 (33)	8–11 (18)	ND
Supralabials	9 (5)	8–9 (2)	9 (11)	7–10 (263)	6–9 (8)	7–9 (33)	7–9 (18)	8 (1)
Dorsal scale rows	17–17–15 (5)	17–17–15 (2)	17–17–17 (11)	19 or 17–17–17 or 15 (263)	19 or 17–17–17 (8)	15–15–15 (33)	17 or 15–17 or 19–17 or 15 or 13 (18)	ND–17–ND
Ventrals	232–238 (5)	227–236 (2)	232–251 (11)	235–282 (263)	217–253 (48)	212–233 (33)	196–218 (18)	240–252 (3)
Subcaudals	152–161 (5)	147–148 (2)	140–161 (9)	137–192 (223)	109–170 (32)	127–153 (33)	108–132 (16)	143–158 (3)
EASS*	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent
HL **	6 (1)	10 (1)	6 (2)	4–6 (18)	5 (2)	6–7 (4)	6–8 (4)	ND
Tail length as a percentage	28.4–32.9 (5)	46.5 (1)	29–32 (6)	26.8–33.7 (62)	24.2–28.3 (17)	31–33 (33)	26.5–31.3 (14)	29.1 (1)

ND: no data.
* EASS: expanded area on the distal portion of the sulcus spermaticus.
** HL: hemipenis length of everted organs in relation to the number of subcaudals.

According to Cope (1866), Smith (1942), Zweifel (1959), Myers (1982), Torres-Carvajal et al. (2012) and Missassi and Prudente (2015) (Table 2), in comparison with the other species of *Imantodes* (characters in parentheses), this species differs from *I. cenchoa*, *I. gemmistratus*, *I. lentiferus* and *I. tenuissimus* in its dorsal pattern of very light blotches, which are not sharply defined (vs dark and well defined dorsal blotches with shape of wide saddle); from *I. gemmistratus* by having 11–12 infralabials (vs 9–10), everted hemipenis equal to 6 subcaudals (vs 5); from *I. tenuissimus* by having 9 supralabials (vs 8); from *I. inornatus* by vertebral pattern of very light saddles or

blotches (rather than fuzzy dark crossbands), 232–238 ventrals and 152–161 subcaudals (vs 196–218 ventrals and 108–132 subcaudals); from *I. lentiferus* by having 17 dorsal scale rows anteriorly and at midbody (vs 15–15); from *I. chocoensis* by the presence of loreal (vs the absence of loreal); and from *I. guanae* by having 152–161 subcaudals (vs 147–148), by the absence of a dark pigmentation on temporal region (vs presence of a dark brown temporal stripe), dorsum of head orangish brown mottled with grayish brown (vs light brown with dark brown blotches), and the absence of expanded area on the distal portion of the sulcus spermaticus (expanded area present).

Discussion

This is the first record of this species for Colombia and this new finding extends the geographic distribution of *Imantodes phantasma* by more than 65 km in straight-line distance northeast from its nearest previously known Panamanian locality and also allows an expansion of its elevational range, from 1100 to 1175 m. The previously known Extent of Occurrence (EOO) in which this species was found was less than 100 km² (Ibáñez et al. 2013); with this new record added, this EOO increases to 690 km² (estimate made with GeoCAT; Bachman et al. 2011). Because of the small range (<5000 km²), few locations (>5) and threats to habitats (deforestation), we recommend a change to Endangered using the IUCN criteria B1ab(iii).

This is the first record of this species since 1966, 51 years after its description. The possible reason for this is the absence of explorations in the Serrania del Darién, specifically, in the Cerro Tacarcuna, a mountainous formation within the Serrania, considered as a center of endemism and high biological uniqueness (Hernández et al. 1992, WWF 2008). Lack of explorations in the area might be due to difficulty in access, as well as the recently ended Colombian armed conflict.

The presence of *I. phantasma* in Colombia supports the ecosystems continuity on the Serrania del Darién, where the climatological, physiographic and landscape composition show particular conditions for the establishment of areas of endemism for biota (Myers 1969, Hernández et al. 1992). Also, its presence may be due to the biogeography of the mountain rainforests of the Serranía del Darién (Myers 1969, Myers and Lynch 1997). Threats to this species include habitat loss and fragmentation, as a result from changes in land use by agriculture, logging, and illegal mining, activities that are increasing and ascending on the altitudinal gradient from the foothills of Cerro Tacarcuna, as a result of the expansion in the colonization of this area.

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Authors' Contributions

All authors conducted the survey. GFM wrote the text and made the map. GFM and GCA made the identification, tables, made counts and measurements, and photographed the specimens. All authors read and approved the final manuscript.

References

- Bachman S, Moat J, Hill AW, de la Torre J, Scott B (2011) "Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool." In: Smith V, Penev L (Eds) e-Infrastructures for data publishing in biodiversity science. ZooKeys 150: 117–126.
- Boulenger GA (1896) Catalogue of the Snakes in the British Museum, Vol. 3. Taylor and Francis, London, xiv + 727 pp.
- Cope ED (1861) Contributions to the ophiology of Lower California, Mexico and Central America. Proceedings of the Academy of Natural Sciences of Philadelphia 13: 292–306
- Cope ED (1866) Fifth contribution to the herpetology of tropical America. Proceedings of the Academy of Natural Sciences of Philadelphia 18: 317–323.
- Cope ED (1894) On the species of *Himantodes* Dumeril and Bibron. American Naturalist 28: 612–614
- Echavarría-R. JD, Rentería-M. LE, Rengifo-M. JT (2016) Nuevo registro de *Imantodes chocoensis* (Squamata: Dipsadidae) en el Chocó biogeográfico colombiano. Revista Colombiana de Ciencias Animales 8 (1): 14–19. <http://doi.org/10.24188/recia.v8.n1.2016.198>
- Frota JG, Missassi AFR, dos Santos-Costa MC, Prudente AL (2015) New records of *Imantodes lentiferus* (Cope, 1894) (Squamata: Dipsadidae) from the states of Pará and Mato Grosso, Brazil. Check List 11 (4): 1–4. <https://doi.org/10.15560/11.4.1686>
- Hernández J, Hurtado A, Ortiz R, Walschburger T (1992) Unidades Biogeográficas de Colombia. In: Halffter G (Ed.) La Diversidad Biológica de Iberoamérica. Acta Zoológica Mexicana. Xalapa, México, 105–151.
- Ibáñez R, Jaramillo C, Richman N, Böhm M (2013) *Imantodes phantasma*. The IUCN Red List of Threatened Species 2013: e.T176821A1448783. <https://doi.org/10.2305/IUCN.UK.2013-2.RLTS.T176821A1448783>
- Jaramillo-Martínez AF, Valencia-Zuleta A, Castro-Herrera F (2013) *Imantodes chocoensis* Torres-Carvajal, Yáñez-Muñoz, Quirola, Smith, & Almendáriz, 2012 (Squamata: Dipsadidae): First records from Colombia. Check List 9 (5): 1070–1071. <https://doi.org/10.15560/9.5.1070>
- King RB (1989) Sexual dimorphism in snake tail length: sexual selection, natural selection, or morphological constraint? Biological Journal of the Linnean Society 38: 133–154. <https://doi.org/10.1111/j.1095-8312.1989.tb01570.x>
- Köhler G (2008) Reptiles of Central America. 2nd Ed. Herpeton-Verlag. 400 pp.
- Linnaeus C (1758) Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. tomus i. editio decima, reformata. Laurentii Salvii, Holmiæ. 10th Edition. 824 pp. <https://doi.org/10.5962/bhl.title.542>
- Missassi AFR, Prudente ALC (2015) A new species of *Imantodes* Duméril, 1853 (Serpentes, Dipsadidae) from the eastern Cordillera

- of Colombia. *Zootaxa* 3980 (4): 562–574. <https://doi.org/10.11646/zootaxa.3980.4.6>
- Missassi AFR, Costa JCL, Prudente ALC (2015) Range extension of the Chocoan blunt-headed vine snake: *Imantodes chocoensis* (Serpentes: Dipsadidae) in northwestern Colombia. *Salamandra* 51 (3): 269–272.
- Myers CW (1982) Blunt-headed vine snakes (*Imantodes*) in Panama, including a new species and other revisionary notes. *American Museum Novitates* (2738): 1–40.
- Myers CW (1969) The Ecological Geography of Cloud Forest in Panama. *American Museum Novitates* (2396): 1–52.
- Myers CW, Lynch JD (1997) *Eleutherodactylus laticarpus*, a peculiar new frog from the Cerro Tacarcuna area, Panamanian–Colombian frontier. *American Museum Novitates* (3196): 1–12.
- Pazmiño-Otamendi G, Rodríguez-Guerra A (2013) *Imantodes lentiferus*. In: Torres-Carvajal O, Salazar-Valenzuela D, Merino-Viteri A (Eds) *ReptiliaWebEcuador*. Version 2013.0. Museo de Zoología QCAZ, Pontificia Universidad Católica del Ecuador. <http://zoologia.puce.edu.ec/vertebrados/reptiles/FichaEspecie.aspx?Id=497>. Accessed on: 2017-6-5.
- Pérez-Santos C, Moreno AG (1988) Ofidios de Colombia. Torino, Italia. Museo Regionale di Scienze Naturali, Monograph 6: 1–517.
- Peters JA, Orejas-Miranda B (1970) Catalogue of the Neotropical Squamata: Part I. Snakes. *United States National Museum Bulletin* 297: 1–347.
- Rojas-Morales JA, Escobar-Lasso S, Osorio-Ortiz A, Lozano-Ríos LA (2013) Third observation of the Chocoan Blunt-headed Vine Snake, *Imantodes chocoensis* (Serpentes: Dipsadidae) for Colombia. *Biota Colombiana* 14 (2): 341–344. <https://doi.org/10.21068/bc.v14i2.295>
- Rojas-Morales JA, Arias-Monsalve HF, Mendoza-Mendoza I (2014) Geographical distribution of *Imantodes cenchoa* (Serpentes: Dipsadidae) in Colombia: filling gaps for the montane cloud forests of northern South America. *Herpetotropicos* 10 (1–2): 9–16.
- Shine R, Olsson MM, Moore I, Le Master MP, Mason RT (1999) Why do male snakes have longer tails than females? *Proceedings of the Biological Society of London, Series B* 266 (1434): 2147–2151. <https://doi.org/10.1098/rspb.1999.0901>
- Smith H (1942) Mexican herpetological miscellany. *Proceedings of the United States National Museum*. 92 (3153): 349–395. <https://doi.org/10.5479/si.00963801.92-3153.349>
- Torres-Carvajal O, Yáñez-Muñoz MH, Smith EN, Quirola D, Almenázar A (2012) A new species of blunt-headed vine snake (Colubridae, *Imantodes*) from the Chocó region of Ecuador. *ZooKeys* 244: 91–110. <https://doi.org/10.3897/zookeys.244.3950>
- Uetz P, Freed P, Hošek J (Eds) (2017) *The Reptile Database*, <http://www.reptile-database.org>. Accessed 2017-6-5.
- WWF Colombia, Fundación Ecotrópico, Cecoin (2008) *Análisis Ecorregional para la construcción de un Plan de Conservación de la Biodiversidad en el Complejo Ecorregional Chocó-Darién*. WWF, Comisión Europea (CE), WWF Suecia/SIDA, WWF Reino Unido/DFID, Santiago de Cali, Colombia, 272 pp.
- Zweifel RG (1959) Snakes of the genus *Imantodes* in western Mexico. *American Museum Novitates* 1961: 1–18.